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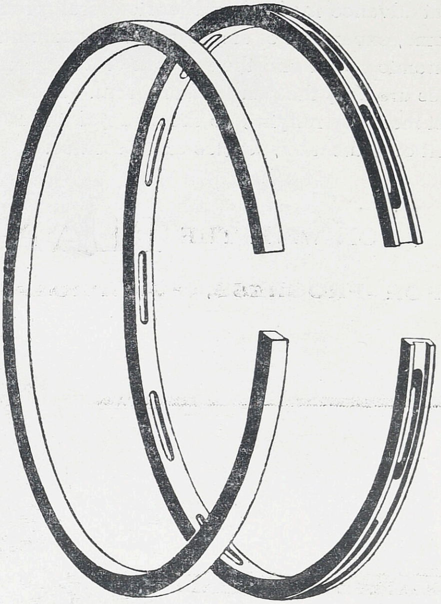

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-Jawaharlal Nehru-

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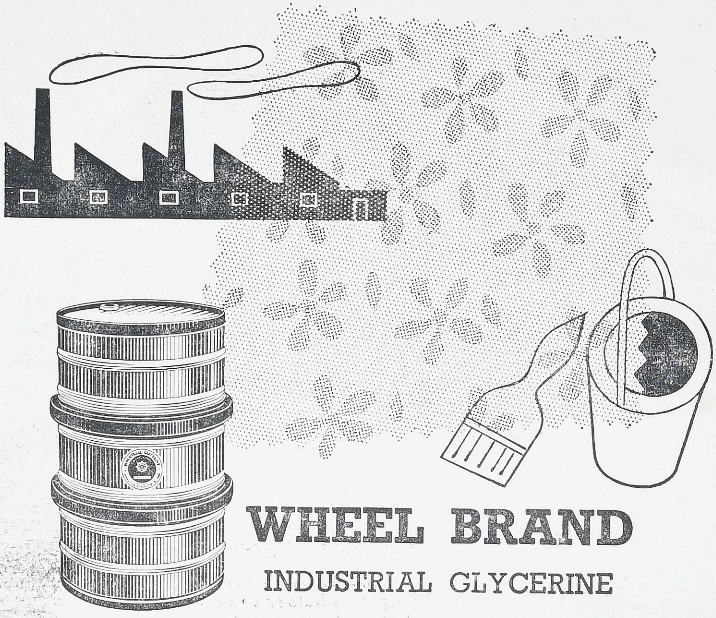

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ANNUAL
1958

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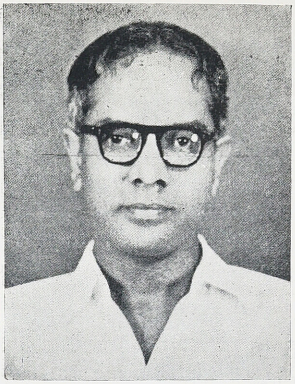

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MADRAS.

THE WAY AHEAD

Since I wrote in my last quarterly issue—WE WILL NOT FAIL—United States has offered us 225 million dollar loan. We are grateful to that great country for this magnificent help. We are enthused to learn that Senator Humphrey has proposed a 900 million dollar "Marshall Plan" for India in addition to the recent loan. We are sure that our Vice—President Dr. S. Radhakrishnan's presence in United States will create the right climate. All parties in the United States are unanimously agreed on the principles of massive economic aid to India as India is the only Asian country that "is by the strength of her example and by her traditions of democracy and justice can play an important part in the defence of the democratic way of life": to put it in the words of the British Prime Minister Mr. Harold Macmillan. Mr. Henry Cabot Lodge the other day expressed the same sentiment in New York: "In India there is a tremendous amount of friendliness for the United States and appreciation and gratitude for what we have done and a strong determination to be independent. If countries will be independent and stand up for their independence, then we will have a peaceful world."

There need not be any apprehension about repayment of Loans. We have invested so far in public sector alone over Rs. 2000 crores and by 1961 we will further invest a similar amount.

After all, repayment for 1958—59 will be Rs. 23 crores. In the year after that it will be Rs. 35 crores and after that Rs. 92 crores. In 1961 the amount due will be Rs. 123 crores. In 1962 it will be Rs. 107 crores only and the next year it drops to Rs. 48 crores.

By then all giant Steel plants will go into full production. We will not only stop importing steel but export pig iron and earn a lot of foreign exchange.

And our labour force will also be efficient and industry-conscious. Hard work and the will to succeed will take us nearer to our goal.

We need greater production.

In this great adventure of growing industrially great, productivity of the land must keep step with industrial progress. A great awakening among the rural masses to produce more food is being felt and with the community project development covering all Indian villages the country will produce surplus products. Industrial growth depends on agricultural growth.

The mighty dams springing all over the country will give a lie to the proverbial statement that the Indian agriculture is a gamble of seasons.

India is a land of gods. Centuries of successive invasions and tyrannies have not made us forget our fanes. Our Gods will grow food in our fields and wealth in our factories.

INDUSTRIAL PROGRESS

JAWAHARLAL NEHRU

Prime Minister of India

During the 10 or 11 years since the last world war the rich countries became richer than India in spite of all the efforts made by India to advance. The difference between India and any other country which was industrialised was greater to-day than it was ten years ago. This was because the highly industrialised countries had got into a self-progressing economy while we are yet to break that barrier.

How are we to do it? Not all the efforts of private enterprise, even if money is showered upon them, can do that revolution. They might do it in 50 or 60 years, or rather events will do it. But then, you have to face another problem and that is the social problem, the democratic problems and all that. England and countries like that became industrialised at a moment of very retarded democracy in those countries. One of the most important leaders of the Labour Party of England once said that if England 100 or 150 years ago had full democracy, that democracy would not have permitted industrial revolution to come in because the industrial revolution coming in meant a terrible burden for the people. If you have adult suffrage and democracy then the people say, why carry more burdens? There would be more demands. Democracy means more demands and less obligations. They in the West got over that difficult period by having practically no real democracy.

In India we might do it but subject to many factors. Firstly, it will take a few generations. Secondly, it would involve upheavals where Governments will disappear because people will not put up with it So, merely to think that we can repeat here what happened in England or America a hundred years ago is illogical and not correct, quite apart from our emotional approach to the problem. Therefore, another approach has to be made.

Soviet Union was the only country which had made a tremendous economic advance in the last 40 years but had had to pay a heavy price for it. Even then it had taken them 40 years.

You cannot reproduce the history of another country. The problem we have to face is unique and the problem cannot be solved by what are normally called the methods of free enterprise. Would free enterprise have gone in for three or four huge steel projects and wait for years and years for any profit to come out of it?

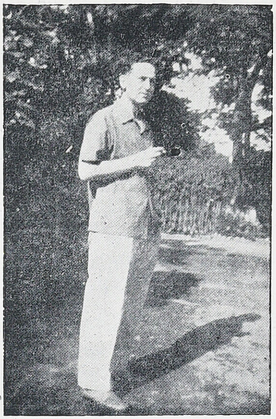
Now one of the steel plants is a private plant, the Tatas. It is a very fine plant. They are doubling their production. But, how are they doing it? They are doing it with the help of big loans from abroad, from the U. S., from our Government etc. You will find that private enterprise complains—I do not say that their complaints sometimes are not legitimate—but the amount of help which we are constantly giving to private enterprise is surprising.

In fact private enterprise, some of it, at any rate, is carried on very much by public help and the element of private enterprise is becoming less and less even in private enterprise.

We have not casually said that we want a public sector, a private sector and a mixed economy. We have not casually said that we want a Socialist pattern of society. It becomes a decision after years of thought.

Socialism does not come and will not come so long as India is poverty-stricken. A poor country connot envisage or work for a Socialism which is a grinding poverty for everyone. But, we have to lay the foundations of industrial progress and then Socialism comes step by step. In fact, the two go on parallel lines.

* * *



Mr. KICKBUSCH, a great friend of India, is now in Germany. Here he pleads for a thorough and systematic training to be given to Indian labour.

TECHNICAL TRAINING FOR INDIA'S INDUSTRIALIZATION

ALFRED F. KICKBUSCH

Trade Commissioner, Federal Republic of Germany, Madras

It has often been said that there exists a great similarity in the economic development of post-war Germany and India after Independence. Both countries started practically on a shoestring basis: Germany with the Currency Reform in 1948 which paved the way for economic rehabilitation, and India with Independence which gave the green light to independent economic development. But here the similarity stops and in my opinion that goes to show that attractive though comparisons sometimes are, they may also be misleading.

It is no doubt true that the German economy in 1948 did not amount to anything much and was completely down at the heel. Factories had been ground to rubbles in incessant air raids; many others had been dismantled afterwards by order of the Allies and the equipment shipped to those countries which had suffered most during the war. Capital was almost non-existent, for inflation had wiped out or appreciably reduced savings. Yet Germany started on the road to economic recovery with one great asset: the presence of a large, efficient and well-trained labour force and the indomitable will to substitute hard work and long hours to the lack of capital and equipment. According to scientific terminology, the economy of a country rests on three bases: labour, capital and soil, and of the three, capital is but a function of labour in that it constitutes a reserve that has been created by labour.

India is still principally an agricultural country and 70% of her population are mainly

depending on agriculture for their livelihood. The acreage cannot be increased to any great extent, although more scientific methods of cultivation and better irrigation may raise the overall output of food and cash crops. The future of the Indian economy lies in the industrialization of the country which will not only produce the required goods but also absorb unemployment and underemployment in the rural areas.

But industrialization, in small, medium and large enterprises, is dependent of *trained* labour which, as all authorities agree, is still in desparately short supply in India. The pundits who are planning India's development, seem to be fully aware of the problem, for a number of promising starts have already been made. Nevertheless, an almost superhuman task still remains to be done.

India's engineering colleges are turning out a large number of qualified engineers every year and many more are returning from foreign institutions to swell the ranks of those eager to put their knowhow at the service of India's industries. The picture of the labour force which is to work under the supervision and guidance of these engineers is less fortunate. The large majority of them are *trainees* who have picked up their skill more or less at random and who cannot be termed as all-round experts of their particular professions. Their skill, industry and good intentions cannot be doubted, but unfortunately, they have never been given the opportunity to undergo systematic and thorough professional training.

Thus, the Indian labour potential is to a large degree an army of recruits with generals and staff officers, but the lower ranks and the non-commissioned officers are lacking.

The lack of systematic professional training is a factor which has not always been present in the Indian economic setup. European travellers in medieval India, especially to the southern Kingdom of Vijayanagar, tell wondrous tales of the fine specimens of Indian art and craftsmanship of which many examples are still extant. And these foreign observers also give a vivid picture of the closely knit organization of the various crafts and porfessions in guilds which placed great emphasis on the thorough and systematic training of the recruits to the craft or trade. For some reason or other, this commendable practice has been abandoned and at present there are comparatively few industrial enterprises which train apprentices.

By apprentice, I do not speak of the trainee, usually a fully grown man who is being taught a few elementary operations and then left to fend for himself. I fully realize that this practice is frequently necessary to fill the existing vacancies in the industrial enterprises that are springing up all over the country. If, however, the Indian economy is to be geared to top efficiency, a supreme effort has to be undertaken to give thorough and systematic training to Indian labour. I feel and many authorities agree with me that an apprenticeship system more or less along European lines would suit India's requirements. Indian workers have a natural manual skill, intelligence and resourcefulness, but due to lack of proper training facilities these qualities have not been developed to full advantage.

Here is a broad outline of the European apprenticeship system: The boy, or girl, for that matter, leaves school at fourteen. (This factor is of the utmost importance, for a worker who is unable to read and interpret the legends on a blueprint or drawing, study the technical journals in an effort to improve his status, or read the notations on his pay envelope, will never attain full efficiency.) Even after leaving school and while serving the apprenticeship, the youngster will have to attend night classes at the vocational training school corresponding to his profession or craft.

The time an apprentice has to serve to learn all the tricks of his trade, in theory and in practice in systematic and allround manner, will vary according to the particular profession. Generally, it will be three years. After he

has completed his apprenticeship and his instructors think him fully competent, he may stand for the journeyman's examination before a board on which the Chamber of Commerce is represented. Only after he has passed the examination, he may call himself a fully qualified skilled worker and claim the pay which the Trade Union and the employers have fixed for the particular category by collective bargaining.

After working for several years at his trade, now as a skilled labourer, and attending more night classes, our young man may pass the master's examination which will entitle him to instruct apprentices. These masters act in a supervisory capacity and they constitute the labour petential from which the shop superintendents and supervisors are being drawn. It may be mentioned in this connection that even the students of the engineering sciences have to provide proof that they have undergone at least six months practical training in the particular line they wish to study.

I am well aware that this pattern of professional training cannot be adopted all in one piece and at short notice in India. Nevertheless, an effort should be made to introduce it gradually and in well-planned phases.

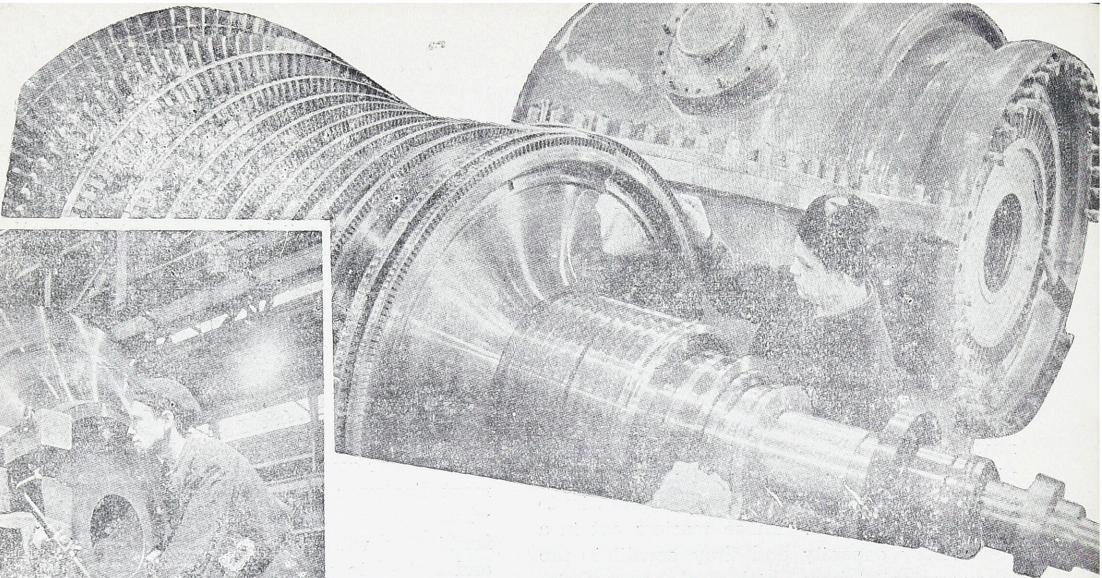
A number of training facilities are already available in India for building up a skilled labour force. They provide the framework into which an apprenticeship system could be fitted. The railways have excellent training shops where all kinds of mechanics are being formed. In the Madras area, particular credit must be given to the Training School of the Integral Coach Factory. The management do not hire a machanic just on his mere sayso. No matter what he claims his qualifications are, he will have to pass a theoretical and practical entrance examination. He is then put for six months through the mills of the Training School which grind exceedingly fine. Only after the condidate has given a satisfactory account of himself during that period and at the final examination, he is admitted to the I. C. F. workshops.

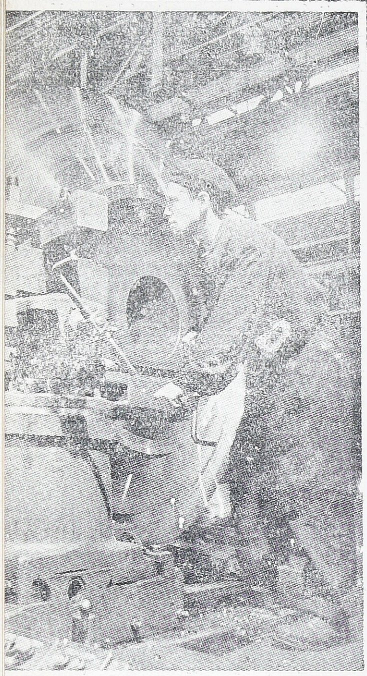
Most industrial enterpises provide on-the-job training when they are filling vacancies, and some have regular schools for apprentices. Unfortunately, this system is not yet universal practice.

Another commendable effort is the Government Footwear Training Center at Perambur where shoe workers and technicians are being familiarized with modern production methods and up-to-date machinery. The Training now being whipped into final shape at the Guindy Industrial Estate will turn out the higher categories of footwear technicians. And very soon the Prototye Workshop of which the German Government has made a gift to Government of India, will go into operation near Delhi. The graduates from this institution will be a credit to their profession and their thorough knowledge of mechanical engineering will greatly benefit the Indian economy.

Mention of the Industrial Estate brings me to my conclusive remarks. This institution will not only provide numerous facilities to a number of individual entrepreneurs, but its most important feature, as I see it, will be the extensive training facilities designed to build up a pool of skilled workmen and technicians. After they have received basic and/or secondary instruction, they will either revert to their former workshops where they will turn their newly acquired skills to full advantage or hand on such knowledge to their colleagues, or they may even aspire to higher positions and hence higher pay cheques also.

* * *





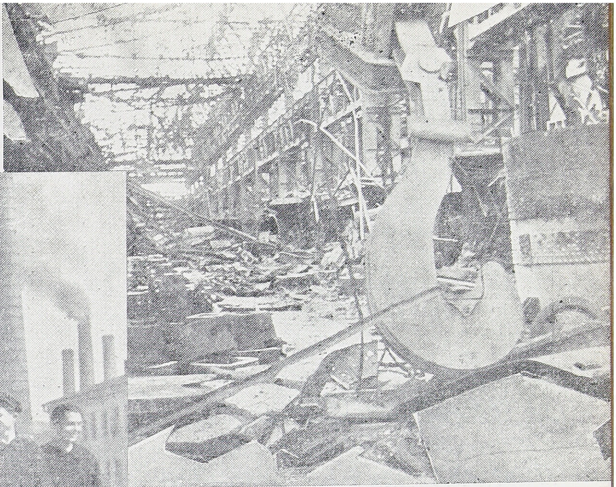
MACHINES - - - - FOR BHILAI

The Lenin Nevsky Works, a giant enterprise of the engineering industry of Leningrad, is busy working on many important orders for Bhilai. Several large units of the AKV-12-p machine are being manufactured in the turbine department for shipment to India. The top photo shows foreman A. Usenko examining the equipment before it is despatched from the industrial establishment.

In the second photo from the top Krylov is seen finishing his work of machining the casing of a super-charger ear-marked for Bhilai.

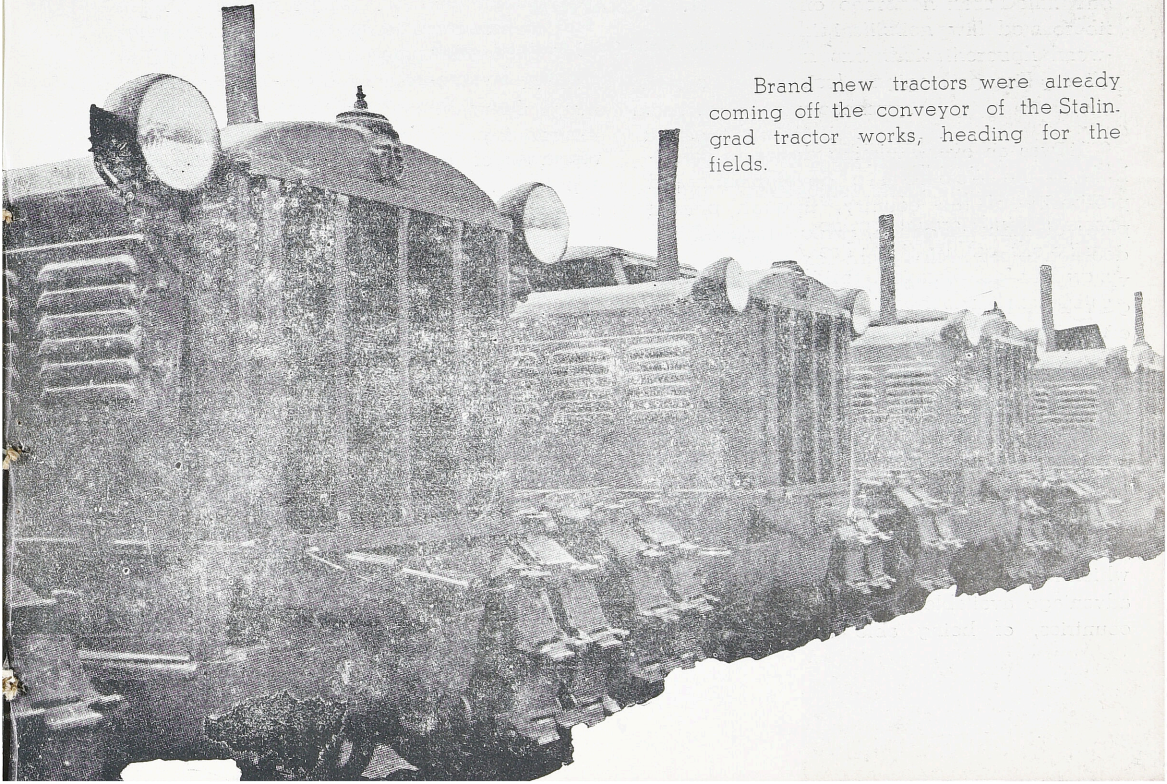
About 1,600 of the 1,800 instruments the Manometer Plant at Moscow was under contract to supply to India have been dispatched. These include different manometers and electronic instruments. There are also automatic electronic potentiometers for measuring, recording and regulating temperature.

The Indian orders are being carried out at Soviet enterprises with extraordinary speed. Mikhail Pankin, an assembly worker at the Manometer Plant, and his mate, Ivan Borodin, have assembled 50 standard manometers for India.



The Russian workers after a day of productive work.

Brand new tractors were already coming off the conveyor of the Stalingrad tractor works, heading for the fields.



4,500,000 Piston Rings per year, as good as best in the world, will not only save but also earn foreign exchange.

PISTON RINGS

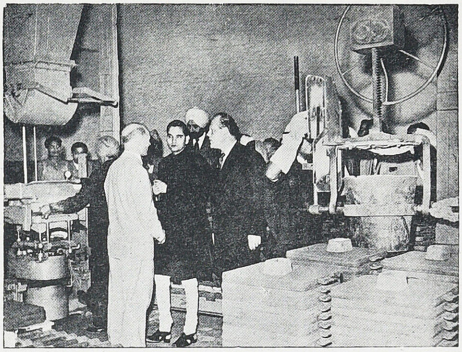
H. P. NANDA

Governing Director, Goetze (India) Private Ltd., Patiala

It was an overwhelming desire to contribute to the economic development and prosperity of the country, through phased plans of industrialization, which induced the decision to establish a plant for manufacturing vital components, namely, piston rings, sleeves, gaskets and oil seals, for internal combustion engines with the technical co-operation of Messrs. Goetzewerke Friedrich Goetze A. G. Burscheid, West Germany. The programme to manufacture the above items was evolved in consideration of very rapid development and increased manufacture of automobiles, tractors and stationary diesel engines in India.

The automobile industry in this country, which is still in its infancy, does not enjoy the advantage available to the industry in other countries, of being able to draw on the resources of ancillary manufacturers for the supply of vital components, the manufacture of some of which is highly specialized. With the encouragement, co-operation and valuable assistance received from His Highness the Rajpramukh, the Chief Minister, the Finance Minister, the Chief Secretary and other Government officials of the then PEPSU State now merged with the Punjab, and Central Government officials, the foundation-stone of the factory was laid on September 29, 1955. On that occasion His Highness the Rajpramukh in his message hoped that the factory, which was being established, would not only produce goods of quality equal to the world's best, but would also assist in making India self-sufficient.

I am happy and feel proud to convey to friends in the trade that we have been successful in establishing a self-contained factory to



Piston Ring Plant in operation.

produce quality products equal to the world's best from raw material available in this country, with the co-operation, technical help and 'know-how' of our good friend, Mr. Rolf Goetze, President of Messrs. Goetzewerke Friedrich Goetze A. G. Burscheid.

A piston ring, which looks very simple, is a precision article. Its importance and function in an engine can be compared to that of the heart of a human being. No other part in an internal combustion engine is subject more to heavy work than the piston ring.

Its function is to seal the combustion chamber from the crank case under high temperature and pressure at a comparatively higher speed and poor lubrication without losing its tension, changing shape and wearing fast. Besides, it has to transfer heat, return lubricating oil to the crankcase, prevent oil burning in the combustion chamber and adapt itself to distorted cylinders.

The production of such an important and high precision article is not only complicated but calls for proper equipment and highest degree of foundry and machine shop skill. Before the required properties can be imparted to a piston ring in its manufacture, a number of conditions must be fulfilled in the foundry and machine shop. They are :—

1. The rings must be individually cast to have a definite highly uniform grain structure and possess good elasticity.
2. The texture of modulous of elasticity must be constant not only between individual rings and complete batches but also over long periods of time.

These can only be achieved by careful regulation of heat and maintenance of constant temperature during melt, strict control over chemical composition, moulding and casting operations.

Experience had shown that the desired quality of blank rings could not be cast by following the conventional means and methods. To regulate and maintain the desired temperatures during melt, a low induction electric furnace of 1.5 ton capacity was specially got munufactured by Messrs. A. E. G. in Germany to suit the conditions, the installation of which took three months of solid work.

To control the consistent quality of castings in mass production, our foundry has not only to be equipped with a most up-to-date laboratory for metallurgical and chemical analysis but also completely mechanised with moulding machines, sand preparation plant and underground and overhead conveyor systems. Before the cast rings are sent for machining, they are cleaned for sand and other impurities by modern cleaning machines.

To produce rings possessing the superior quality of consistency, shape and elastic behavi-

Shri Manubhai M. Shah, Union Minister for Industry at the Opening ceremony of Goetze's Piston Rings Factory.

our with the desired specific radial pressure distribution, thus leaving the natural tension of the rings unimpaired, special machines developed by Messrs. Goetzewerke after years of experimentation, have been installed together with a de-dusting plant to keep the tool tips cool and obtain better finish and tolerances and at the same time keep the machines and atmosphere in the factory clean and healthy.

To ensure the desired precision in a finished ring up to 1/1000th of a millimetre, special automatic machines have been installed for inspection of width and cutting the gap in addition to various conventional testing equipment.

At each step of production the rings are inspected for defects and only the best are passed from one stage of production to another until final inspection, thus ensuring that only quality products go out of the factory.

Another additional advantage is the installation of the most modern hard chromium and tin plating plants, the first of its kind in this country.

We have also a fully equipped tool shop for making all our tools for machines for producing various types and sizes of piston rings and sleeves. For producing cylinder liners centrifugal casting machines have been installed.

The installed capacity of the plant is $4\frac{1}{2}$ million rings per year, capable of taking care of not only the country's present requirements but also the needs of neighbouring countries, thus saving and earning the much needed foreign exchange for the country.

Although most of the equipment and machines are of the latest and automatic type, they cannot by themselves produce quality rings. It was, therefore, necessary to employ expert German technicians who could supervise the production of quality rings in this factory and at the same time train Indian personnel during their stay here. In addition to the German experts, young qualified Indian engineers were sent to Germany for extensive training and specialization in various departments who are now working in the factory and training other personnel in turn.

It is proposed to have an apprentice school established in the near future to train young mechanics for specialized jobs under the supervision and guidance of both German and Indian engineers.

To ensure wider distribution of quality products, Messrs. Escorts (Agents) Private Ltd., have been appointed our Sole Selling Agents for India, Burma, Ceylon, Malaya and Indonesia.

I am happy to mention that the rings produced in our factory were sent to Messrs. Goetzewerke and other manufacturers for exhaustive test and report, and they have confirmed after analysis and test that our rings are as good as the best produced in Europe and other countries.

* * *

For

QUALITY

PRINTING

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MADRAS - 17

The engineer who chooses Meehanite Metal for castings knows exactly what he is getting. Meehanite castings are made in over 150 foundries throughout the world and find application in every industry in the engineering field.

MEEHANITE IN THE SERVICE OF INDUSTRY

B. N. BALIGA, B.SC. (MET), A.M.I.E. (INDIA)

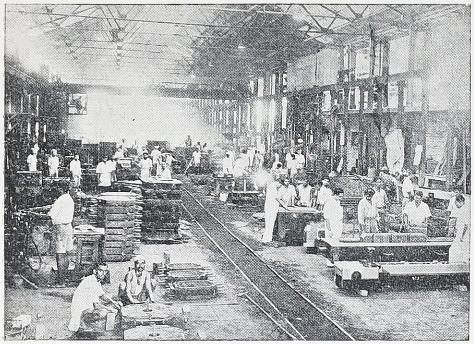
Foundry Manager, Cooper Engineering Limited, Satara

Industry covers a wide field and engages in many diverse activities. Each branch of Industry has its own particular problems but they all have one thing in common—the need for sound, dependable castings to guaranteed properties.

It is fundamental to engineering design that the material of construction should be of known and consistent properties, on which calculations can safely be based. For this reason, Meehanite High Duty Iron castings meet a real demand. They provide the engineer with a material which combines precise and consistent physical properties, uniformity of structure and soundness of construction. Meehanite castings are to-day being produced in more than 150 foundries throughout the world and are being used to serve the needs of a wide range of industry. They enjoy a reputation for dependability, based on reliable service to industry for the last many years. In India, Meehanite has made steady progress and to-day there are four foundries manufacturing Meehanite castings, and their total annual output is over 7000 tons of good castings per annum. Meehanite castings in India are being successfully used in the Diesel Engine, Automobile, Machine Tool, Sugar, Chemical, Textile, Ship-building, Agricultural and many other industries.

Diesel Engines and Automobiles

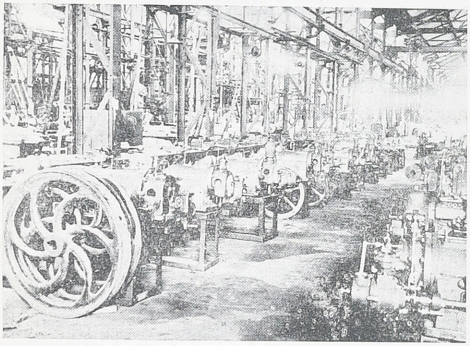
The Diesel Engine industry is a good example of the adaptability of Meehanite to a wide range of service conditions. The modern



Main Bay of the modern Meehanite Foundry of Cooper Engineering Ltd.

medium speed horizontal diesel engines as well as high speed vertical diesel engines manufactured in India contain castings ranging in weight from a few lbs. to 5 tons. They include the heavy beds, fly-wheels, crank-cases, cylinder heads, cylinder liners and pistons. Each of these parts must be produced in the type of metal best suited to the particular condition under which it operates.

The service demands encountered include pressure resistance, heat resistance, and also wear resistance. The cylinder head, for example, calls for both heat and pressure resistance. The liners and pistons on the other hand require wear resistance, together with some degree of resistance to heat.



Assembly of Heavy Cooper Diesel Engines

An important consideration in this, as in other power units is the power to weight ratio and this affects particularly the structural components, such as Beds, Crankcases and Frames. Meehanite makes a useful contribution to meet modern demands in this direction. The high strength properties obtainable in Meehanite castings, together with the high standard of control in their production, make weight reductions possible without loss of strength.

Modern trends in diesel developments call for increasingly complicated castings designed to increase efficiency and to reduce cost. Here again Meehanite has met the demand by the high standard of foundry control in force in all stages of casting production. This control, together with developments in foundry technique enable the Meehanite foundry to keep pace with modern demands in this important field. An example of the modern medium speed horizontal diesel engine is illustrated. This diesel engine, in the complicated cylinder breechend casting of which is incorporated the patented Ricardo Comet-V Combustion Chamber, is capable of developing 26 h.p., as against 18 h.p., with the usual type of Breechend.

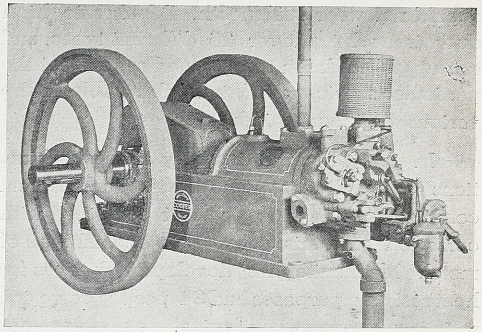
In the automobile industry the problem of getting satisfactory castings is complicated by the very thin sections involved in castings such as cylinder blocks, cylinder heads, manifolds, etc. There are also other castings with thicker sections such as fly-wheels, transmission cases and clutch housings. Automobile castings are required to be manufactured to very narrow limits in specifications with regard to metal composition and physical properties. They are subjected to very rigid inspection and testing and should therefore be free from casting defects such as blow-holes, sand inclusions etc. It is, therefore, necessary that advanced foundry technique be employed in the manufacture of such types of castings.

The entire manufacturing procedure of Meehanite is scientific and proper control is exercised at every stage with the result that the castings produced provide a greater assurance of dependability and freedom from defects. Due to this reason the Meehanite Process is ideally suited for the production of automobile castings. In this connection it may be mentioned that a Meehanite foundry in Bombay has successfully produced automobile castings such as cylinder blocks, cylinder heads, manifolds, fly-wheels, clutch housings, etc., for the Chrysler group of cars and trucks.

Machine Tools

India is developing the machine tool industry at a fast pace during the second Plan period and new factories both in the public and private sector are being started for the manufacture of precision tool room type lathes, milling machines, heavy duty shapers, planers, slotters, radial drilling machines, etc. Meehanite castings are particularly well suited to the machine tool industry. Here the interest lies essentially in close control of structure, so that the various parts meet their individual service conditions. High strength is less important than correct metal constitution and consistent metal properties. It is in applications of this kind that the Meehanite process system of control is especially valuable. For example, the modern lathe bed needs in the one casting a combination of good damping capacity to ensure freedom from vibration, good resistance to wear on the machine ways, easy machinability in all sections, complete stability and adequate strength and rigidity. To get such a combination of properties requires the exact control of metal structure provided by the Meehanite process.

At the present time, the major machine tool manufacturers in India use Meehanite exclusively for their machine tools. Typical examples are lathe bed, head stock, saddle, cross slide, tail stock, shaping machine main body, job table, crank arm, main gear and ram. The lathe bed illustrated is being manufactured

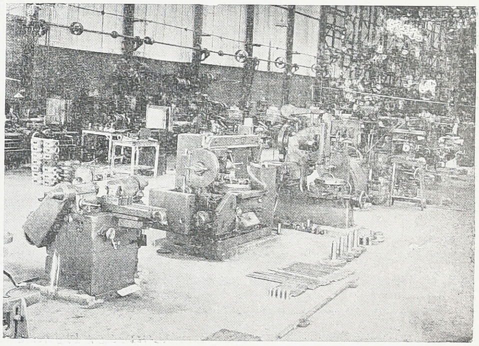


Cooper Ricardo type CR-26 Diesel Engine

in Meehanite for the Hindustan Lathe produced by M/s. Hindustan Machine Tools (P) Ltd., Bangalore, a Government sponsored Factory.

Wide Applications

In the sugar industry castings are required to withstand various conditions such as wear and corrosion and in some cases, high strength properties are called for. Typical examples are scraper plates, trash plates, couplings, sugar rollers and gears. The scraper plates and trash plates have to resist wear and also withstand the chemical action of the sugar-cane juice. Sugar mill couplings have to be of very high strength, in the region of 23 tons per sq. in. The metal used for sugar rollers should have exceptional gripping qualities and therefore



A View of the Machine Shop

should not wear out smooth. Meehanite high duty irons have over 26 different types, and each type has been so designed as to meet the particular service conditions obtainable in the various engineering industries.

In the Chemical industry many combinations of conditions are met with such as heat combined with wear or heat combined with corrosion and this calls for a special type of metal. Meehanite has developed 6 types for heat resisting purposes and 3 types for corrosion resisting purposes. Typical examples are retorts, heat-treatment pots, oil refinery tube supports, exhaust valve boxes, manifolds and super-heater headers under the heat resisting types and pumps, valves, fittings, evaporators, condensers, filter presses and reaction vessels under corrosion resisting types.

Physical Properties

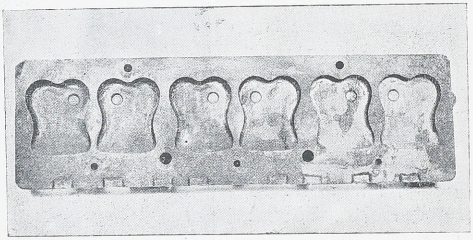
Meehanite has also very wide application in textile, ship building, agricultural and many other industries. In India steam and wrapping winches have been manufactured in which the major castings have been cast in suitable grade of Meehanite. In the textile industry there are numerous applications such as picking noses, gears and frames and picking bowls where Meehanite has been found to be ideal. In the agricultural industry chilled plough shares, mould boards, shackles, etc., are suitable applications for Meehanite.

In an article of this nature it is not possible to give the physical properties of all the available types of Meehanite. The important properties of the widely used general engineering types of Meehanite are given in the following table:

TABLE

General Engineering types of Meehanite	GM	GA	GB	GC	GD
Tensile Strength (in tons per sq. in. minimum)	24.5	22.5	20.0	18.0	16.0
Transverse Modulus of Rupture (in tons per sq. in.)	44.0	40.0	35.0	32.0	30.0
Compression Strength (in tons per sq. in.)	90.0	80.0	75.0	70.0	60.0
Brinell Hardness (Min.)	230	220	210	195	185
Machinability rating (Dalcher)	50.0	48.0	48.0	47.0	44.0
Equivalent Grade under BSS 1452	23 & 26	20 & 23	20	17	14 & 17

An added advantage is that Meehanite Castings, unlike cast iron, respond to heat treatment. Meehanite castings can be toughened by a simple oil quenching treatment to give a tensile strength of upto 35 tons per sq. in. and a hardness of 260 to 600 Brinell as desired. * * *



Cylinder Head casting for a Dodge Truck

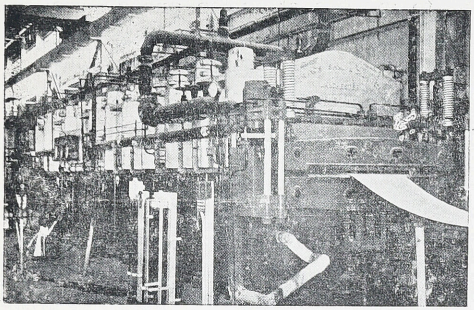
DUNLOP — a name very familiar to millions of Indian public — are putting up a n o t h e r factory at Ambattur near Madras by the end of 1958. Admirable is the part they play in our Five Year Plans.

ASIA'S LARGEST RUBBER FACTORY

India's rubber manufacturing industry is destined to play a key part in fulfilling the country's Five Year Plans. Not only in motor transport, but in industry generally and for the supply of consumer goods, the rubber manufacturing industry is today called upon to play a responsible part as one of India's basic industries. It is a matter for satisfaction, therefore, that the range of rubber products manufactured in India is continually widening and thus helping the industry to meet the vital requirements of numerous branches of the country's economy.

The growth of this infant industry has been truly remarkable. Barely 20 years ago, India imported the bulk of her requirements of manufactured rubber goods. In 1935—36, these imports were to the value of Rs. 2 crores; by 1950—51, they had dropped to a mere Rs. 33 lakhs and in the same year, goods to the value of Rs. 1.66 crores were exported. The Government of India has permitted the import of tyres and tubes to meet the recent shortages arising out of the greatly increased demand for these products. It is expected, however, that the expansion programmes now under way will help to correct this position in the not too distant a future.

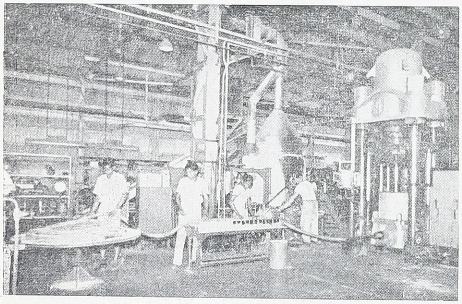
The tempo of economic activity in the country is rising at a rate not known before. This development is very largely due to the growth of heavy industries, power transmission and agriculture, all of which are making increasing demands for rubber products such as rubber covered cables, transmission and vee-belts, conveyor belting and hoses. But the tyre manufacturing section of the industry will have to face the heaviest demand. It is estimated that a fleet of 1,60,000 trucks will be necessary by the end of the Second Plan period to handle the growing goods traffic by road. The production of motor vehicles and bicycles will also increase. By 1960, 57,000 cars and trucks, 12,000 motorcycles and scooters and 12,50,000 bicycles will be manufactured in India per annum. The tyre industry will be required to meet the original equipment and replacement requirements, and it is estimated that by 1960, the demand for automobile tyres will be 16,00,000 and for bicycle



The giant Hydraulic Belting Press at the Dunlop Factory, Sahaganj.

tyres 1,10,00,000 as against the actual production in 1956 of 9,38,400 and 63,20,400 respectively. Besides tyres and tubes, the industry supplies a large number of vital components required for the modern automobile such as fan belts, radiator hoses, adhesives for body building, latex foam cushioning, etc.

The first rubber factory in India was established almost 32 years after that venerable figure John Boyd Dunlop, invented the first practicable pneumatic tyre. India is the only country in the world where the rubber manufacturing industry is largely fed with indigenous natural rubber. As a result, the industry has firmly taken root within a short period of two decades. The tyre manufacturing section is the mainstay of the industry and



Dunlop were the first in India to commence the manufacture of long length braided hose by the lead press process at the Sahaganj Factory.

large scale tyre manufacture in the country was pioneered by Dunlop in 1936 when they set up a factory in Sahaganj near Calcutta which came of age last year. The factory was officially opened by Sir John Anderson, then Governor of Bengal, on the 28th November, 1936. Since then, new plant and machinery have been added from time to time to expand the volume and range of products. This factory is now the largest rubber manufacturing enterprise in Asia.

During the Second World War, the Dunlop Sahaganj factory gave a creditable account of itself and apart from the rapid expansion in the production of tyres and tubes for cars and trucks, aero tyres and tubes were added to the

A Giant tyre being removed from a mould after vulcanisation at the Dunlop Sahaganj Factory. Schemes are under way for increasing production of Giant tyres at Sahaganj. The new Dunlop Factory at Ambattur will also manufacture these tyres.

range. The first major post-War development at Sahaganj was the production of quality cycle rims which was of particular significance in view of the setting up of the many new bicycle factories soon after.

Production of Dunlopillo Latex Foam chushioning commenced in 1951 and in course of the last five years output has gone up four-fold. The increasing use of this material in transport, Assembly Houses, cinemas, hotels, hospitals as well as in the home, promises a great future for this product. The recent

extensions to the Sahaganj factory are of particular interest in relation to the Five Year Plans. The belting and hose plants were officially opened by Dr. B. C. Roy, Chief Minister of West Bengal in December 1952, and it is now turning out conveyor and elevator belting, transmission and industrial vee belts of the best quality which were mostly imported until recently. Long length braided hose by the lead press moulded process, and a number of special types of hoses, hitherto imported, have been added to the range. Recently, Dunlop initiated an anti-corrosion and abrasion resistant rubber lining service which has already enabled the Railways and other enterprises to save valuable foreign exchange.

In the first Five Year Plan period Sahaganj undertook the manufacture, for the first time in India, of tyres for jet aircraft. Another important project now under way is the installation of plant for the production of large earthmover tyres. Numerous expansion schemes are being implemented at Sahaganj to meet the growing demand and a considerable increase in the output of truck and bus tyres, cycle tyres, cycle rims, industrial rubber products and Dunlopillo is planned. Twenty-one years after the founding of India's first tyre factory, Dunlop are putting up another at Ambattur near Madras which is expected to go into production by the end of 1958. Truck, bus and cycle tyres will be produced here primarily for the needs of the South Indian market.

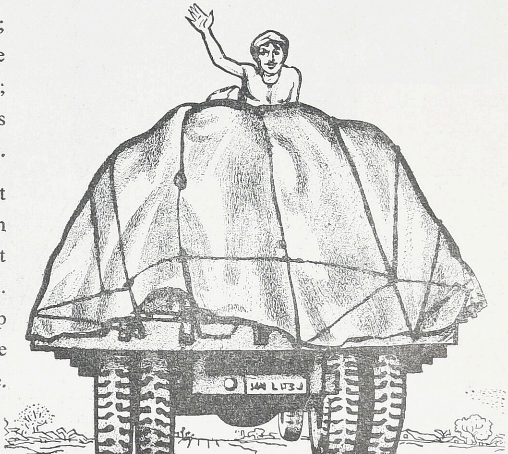
* * *

A short interlude at the service station; a smoke, a chat and, perhaps, a cup of tea nearby; then up again behind the steering wheel and off to the market.

More goods from farms, mines and factories have set motor transport a big task under the Second Plan. Rs. 269 crores have been allocated for road development in the next five years; at the end of the Plan, no well-developed village will be more than 5 miles from a main road; the present goods fleet of about 116,000 trucks will rise at the rate of 10,000 a year.

The Dunlop factory at Sahaganj, the largest rubber manufacturing plant in Asia, has taken in hand active measures to expand output to meet the growing requirements of road transport. A new Dunlop factory is being set up at Ambattur, near Madras, and will commence production in the near future.

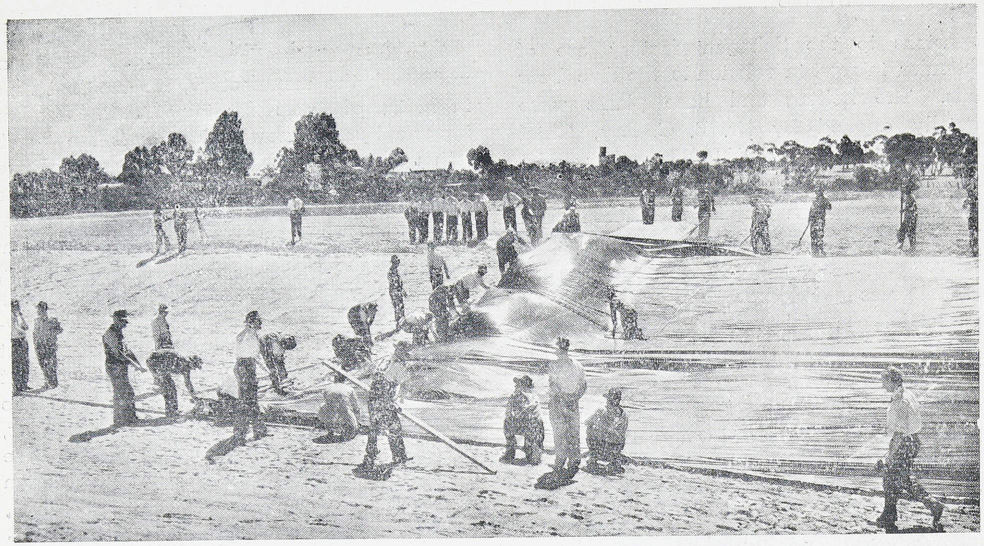
going to town



TRADE MARK

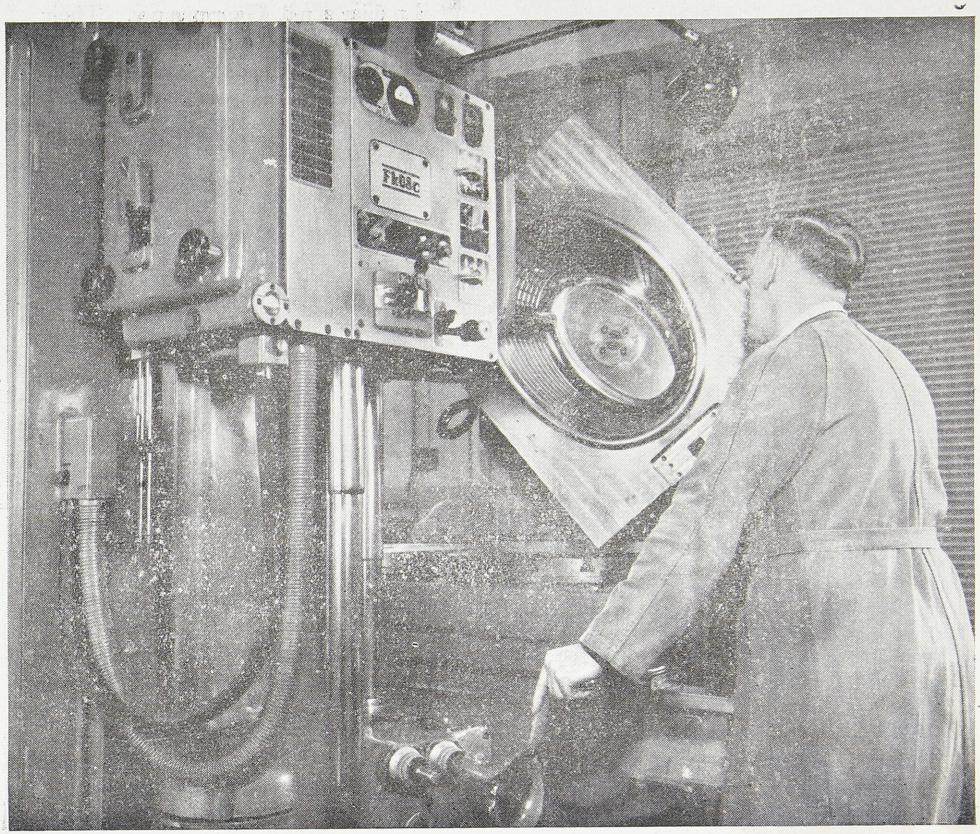
The Dunlop Rubber Co. (India) Ltd.

DC-497



An interesting experiment, designed to reduce losses of water stored in dams and reservoirs, is at present being carried out at Ouyen (Victoria) by the Australian Commonwealth Scientific and Industrial Research Organisation.

The large sheets of plastic were unrolled and spread over the bottom and sides of the dam. They were then heat-sealed to form one piece. The sealing process used has been developed in Melbourne by Plastalon Pty. Ltd. The plastic is waterproof and is practically indestructible by chemical action.



An Australian firm of precision die-sinkers have recently installed a type of die-sinking machine, which can reproduce large precision cavity moulds for die-casting, forging, plastic moulding and rubber manufacture. It cuts reverse images.

The machine is fitted with dual circular tables which make possible the true reproduction of helical or cylindrical forms such as drum type cams.

Manufacturers: Pantogragh Diesinking service, Tooronga, Victoria.

There are silken bonds between India and Germany. Their creativity and scholarship have always been the envy of the world. Today India is proud of German aid.

INDIA WELCOMES GERMAN TECHNICAL AID

Dr. KRISHNALAL SHRIDHARANI

Executive Chairman, Indian Federation of United Nations Associations

The iron age has come to India a century too late. A colonial economy is on the eve of becoming a manufacturing economy. An agricultural country is on the eve of becoming an industrial nation.

The enthusiasm to telescope a century's progress into fifteen years, through three five-year plans, is, therefore, the prevailing mood of India. But economic resurgence depends on three prerequisites:

(1) The will to work. There is plenty of it in the country. Unlike Germany, India has too many idle hands, but this idleness is caused by the paucity of employment and not by any paucity of the will to work. Moreover, Indian hands are dexterious, quick to grasp new techniques. The average Indian is a hard worker, although his personal horse power might be low because of the low content of the calories he can afford to consume and also because of the climate.

(2) The tools to work with. Here India is experiencing great difficulties. Until she has built up her own machine-making industries, she will have to rely on foreign countries for capital goods. And that requires foreign exchange. Germany has helped India a lot in this field perhaps next to the United Kingdom and the United States.

(3) The skill to work. This is India's greatest need. India's demand for skilled technicians, for able craftsmen, for trained engineers is insatiable For years to come, there cannot be any unemployment in their ranks. The paramount need of India today is thousands of engineers and hundreds of thousands of skilled technicians.

India has an instinct. India always had an instinct. Whenever the word technology is uttered, whenever precision is thought of, the first image to appear before the thinking Indian's mental eye is that of Germany. There

might be greater industrial nations, but the Indian popular assumption has always been that Germany excels in technological and technical advancement. So when it becomes clear that Germany has made up its mind to play its role in training skilled technicians in India, the enthusiasm is spontaneous.

There are other reasons why Indians welcome technical aid from Germany. It was the development of Indology in Germany started by Max Muller that made modern Indians conscious of their own glorious Sanskrit heritage. Culturally there have always been silken bonds between the two countries. Each country has respected the other for its creativity and scholarship.

As late as the post-war years, India has appreciated Germany's attitude. For instance, Germany calls India a "developing" country, and not an underdeveloped or a backward country. This should not be brushed aside as a mere play on words; the expression is indicative of a basic attitude. For instance, Dr. Fanz Blucher, Vice-Chancellor of the German Federal Republic, has defined Germany's political attitude to developing countries as one of "partnership". Partnership presupposes equality, political equality and a proud country like India cannot accept anything less. And when Dr. Blucher says that it is to the creditor's advantage to train the borrower's specialized workmen, craftsmen, engineers, sympathetic chords are struck in the Indian heart. For partnership means give-and take. It is the epitome of enlightened self-interest. Any increase in the borrower's purchasing power increases the creditor's selling prospects. There is increased productivity all around. And there is no loss of pride.

There is another aspect of Germany's political attitude toward India that is attractive. Germany takes India as she is, and does not seek to mould her after its own image through indirect economic means. Germany respects India's uncommitted state even when it is committed itself. What is more, Germany is not as great a stickler for the private sector in India, for private enterprise within India, as, for instance, America is. In other words, Germany seems prepared to help India where India wants that aid, even in the state sector.

Now there are two ways of getting a developing country's personnel trained. One is to send students and workers abroad for technological education and experience. India has followed this path, is following this path, and will continue to follow this path. But this method is expensive, laborious, time-consuming and in soms instances unrealistic. And it cannot serve a massive programme.

The other method is to bring foreign teachers to India instead of sending Indian students to foreign countries. This is a method of bringing in few instead of sending out many. India is well on her way on this second path also.

For providing higher technological training, India has set aside Rs. 48 crores in her second five-year plan. This sum is not enough, but fortunately foreign sources have come to India's aid. The country is divided into four zones. The Indian Institute of Technology at Kharagpur covers the Eastern zone. It began to turn out trained experts even before the Second Plan began. It is built and operated with the help of U. N. E. S. C. O.

Russian aid has come in connection with a similar technological institute in Bombay to cover the western zone. The Russian money and experts have come through the United Nations Technical Assistance Programme. This centre is expected to admit students and trainees by 1958. American aid has come forward to construct, equip and run a massive technical training centre at Kanpur to cover the nothern zone.

The southern zone will be served from Madras. Here the Germans are going to pitch their tents and pour their money. It is calculated that it will take three to 3½ years to put the Indian Institute of Technology at Madras into operation. This German-aided

training centre will begin to admit students and specialists and researchers in 1959—60.

Its constitution will be patterned after the Kharagpur model. A special act of the Indian Parliament will create an autonomous Board of Governors to run the institute. This institute will function in close collaboration with industries in the region. Experts of individual industries will be invited as teachers. The special needs of the existing industries (and of industries projected in the Second and Third Plans) will receive particular attention. And trainees of the institute will be placed in running factories and plants for practical experience.

It will be a 3-tier system of education. The last stage, the most advanced stage, will be for advanced study and research Here the duration of courses will depend on individual needs and capacities of each student. The first two tiers will encompass 4-year courses for under-graduates or the first degree students, and these will include broad-based studies in the major fields as well as specialised courses.

In one crucial respect, India is very different from the technologically advanced countries of Europe and America. There are too many hands and too little work. There is staggering unemployment and even more staggering underemployment. The growth of heavy industries can make the country rich and strong, even self-reliant, but by itself it cannot solve the problem of unemployment. Labour-saving devices are not of much help to India. It would be a disaster if heavy industries with their mass production would replace more men to swell the number of the unemployed.

The answer lies in cottage crafts, in small-scale industries. Side by side with heavy industries, these can help in producing more consumer goods and in giving employment to hundreds of thousands of men now idle. The Second Plan has made provisions for developing small-scale industries and cottage crafts.

It is to the credit of the West German Government that it has appreciated this unique nature of Indian economy. It has come forward with another offer — an offer to build and equip and operate a prototype workshop at Okhla near Delhi. The project will cost Germany some 4.3 million D. M. It will prepare skilled craftsmen and technicians for cottage crafts and small-scale industries just as the German-aided technological institute at Madras will turn out technicians and scientists for heavy industries and multi-purpose public utilities. People in India know that Germany is short of engineers and teachers and experts that it can spare to donate their services to foreign countries because practically everybody in Germany is gainfully employed. The help, therefore, is all the more appreciated.

The Indo-German Prototype and Training Centre at Okhla will be a multi-purpose institute. It will provide for

(a) practical and theoretical training of specialists for 551 enterprises and for 559 institutes,

(b) development of special purpose machinery for improvement of plant within 551 enterprises,

(c) development and building of prototypes of such machines (apparatus), implements, components, etc. as are suitable for production by S. S. I. enterprises.

(d) execution of job orders covering such phases of manufacture as cannot be carried out by individual S. S. I. enterprises.

This is the German contribution at the India end. At the home base also Germany continues to train Indian technicians and engineers. There are around 812 full or partial scholarships and followships and traineeships available to Indian talents seeking training in Germany itself. One hundred of these are given by the Federal Government of West Germany. Six hundred of these are given by the Government of the Land North-Rhine-Westphalia; 300 from the Hamburg Chamber of Commerce; 10 from the Senate of the Free

City of Hamburg. The most touching have been the two scholarships offered by the Student Council of the Hamburg University.

I understand that India gets the lion's share of the German programme to assist developing countries in the technical field. In addition are the numberless private experts from Germany helping the private sector of the Indian economy. There are oil prospectors, shipyard experts, mining engineers, etc. India feels it is right and proper to receive such foreign aid. It is said the "miracle of Germany" was to some extent made possible by 3,200 million dollars from America, although this sum was only one-thirteenth of German internal investment. The giver has been a taker once, and so it regards India as an equal even while giving.

Technical assistance, apart from financial investment, has also come in the form of the German participation in the various enterprises and projects in India. The German firms of Krupp and Demag were responsible for starting the Hindustan Steel works at Rourkela. The Mercedes people cooperated with the Tatas in the production of motor vehicles. German experts have been helpful in developing the Kandla port. The Krauss-Maffei people have collaborated with the Tatas in connection with the locomotive plant. German exports are busy at the machine tool factory in Bangalore, at the plant for electrical equipment, at the Hindustan Aircraft Factory. Germans have built a dozen sugar factories and cement plants.

In seven years, between 1947—1956, Indo-German trade has increased eight-fold, and this aspect of Indo-German relations should be mentioned in passing even in an article on technical aid. India is the biggest Asian buyer of German capital and consumer goods. Germany is the third largest supplier to India, next to the United Kingdom and the United States. Germany sold goods worth 800 million D. M. to India in 1956, and supplied 11 percent of the total imports of India.

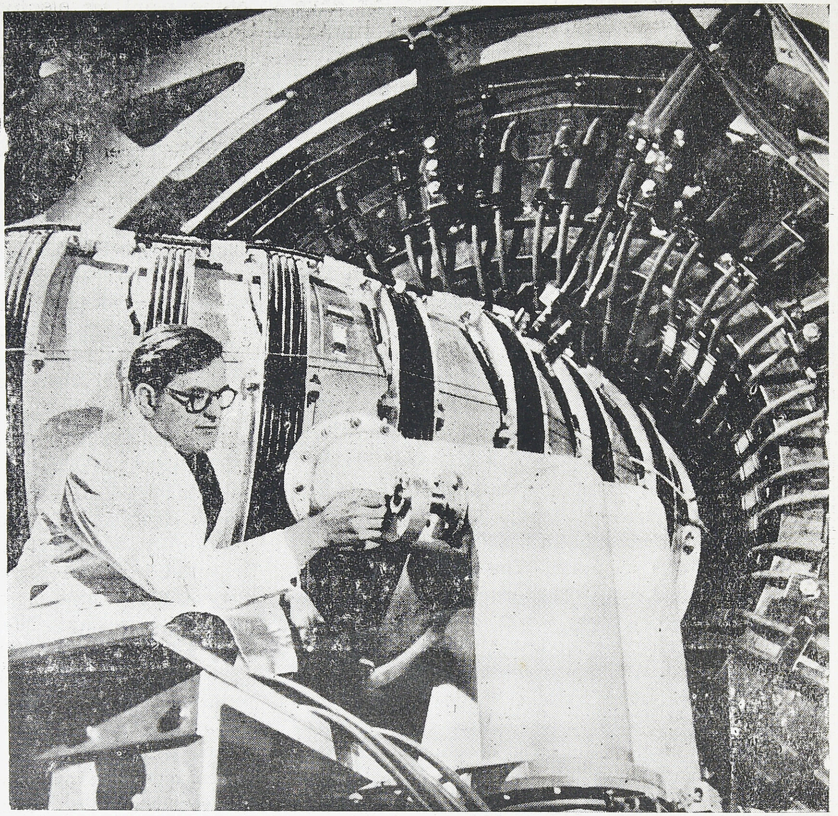
Conversely, Indian exports to Germany have shrunk to 177 million D. M. in 1956 from 268 million D. M. in 1955. To remedy this imbalance, it was Germany which invited an Indian Export Trade Promotion Delegation in the August of 1957. It was an act of enlightened self-interest, because the more Germany buys from India, the more India will be able to buy from Germany. The difficulty is about the language. Another difficulty is that Indian exporters have not yet studied German tastes and and requirements. Measures are being taken to correct these short-comings. Even as it is India's import-export trade with Germany is several times her trade with the entire communist world including Russia and China.

INVEST IN

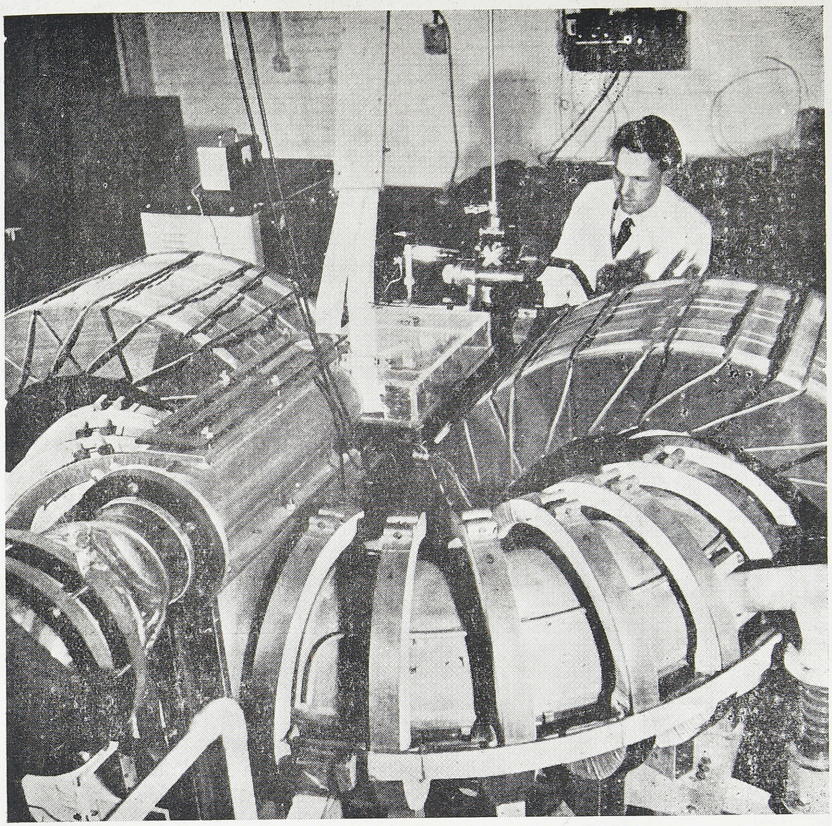
GOVERNMENT OF INDIA

SMALL SAVINGS SCHEME

HARNESSING



Scientists have already shot a temperature of 5 million degrees centigrade into the heavy hydrogen particles of Zeta, proving that the power of the H-Bomb can be released peacefully for constructive purposes.



It is expected that the preliminary results with Zeta may lead to the construction of thermo-nuclear stations in the future, and open up the possibilities of unlimited power from sea water for the home and industries.

Agricultural production plays a great part in the building of socialism in China. The present economic policy of the state still lays the main stress on industrialization, and particularly on the development of heavy industry. But at the same time, we have to put in great efforts to develop agricultural production. The reason for this is clear : the growth of agricultural production is the best way to steadily improve the life of the peasants—the over-whelming majority of the Chinese people, it provides a foundation for the growth of industry and an important source of state funds for construction, and it supplies most of the goods we export.

CHI AN

The Bus Stand at Peking bears eloquent testimony to the great advance Chinese Government has made in providing fabulous amenities to the people. The largeness of outlook in layout is striking and the orderliness is really admirable.

THE BUD AND BLOSSOMS

by

KRISHNA SRINIVAS

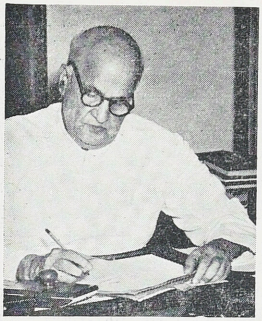
" Inspired and fired by glowing thoughts, the author carries the reader's imagination to lofty regions; and in beauteous language urges him to ponder Life, and Love and lurid Lust; to ponder the nothingness that precedes Life and Eternity that follows......Yet withal, Mr. Krishna Srinivas is an aesthete, as much as a mystic. Like birds, his thoughts unfold their wings and take their flights of fancy through the heaven's starry maze......He embodies his sensitivity of emotion in exquisite poetry, vibrant and palpitating......He is an oriental MYSTIC who has achieved a delicate blend of the East and the West."

HARRIETTE WONG
IN "ORIENT",
HONG KONG

Apply to:

INDIAN INDUSTRIES

4, MOTILAL STREET
MADRAS - 17



Our Planning chief makes a powerful plea for more sacrifices from the Indian public.

NATIONAL EFFORT FOR THE PLAN

V. T. KRISHNAMACHARI

Deputy Chairman, Planning Commission

Increased production of food is certainly possible. Our yields are among the lowest in the world. As the World Bank Mission to India in 1956 said: "Proper application of known techniques, in conjunction with the possible expansion of irrigation and the cultivated area, could increase India's agricultural output four or fivefold. By the time that has been achieved new techniques will have been evolved and the way will be open for further progress."

The methods for achieving production on this scale are well known. These are: full and efficient utilisation of irrigation facilities as and when available; use of improved seeds, fertilisers and organic and green manures and adoption of other techniques, by every family in the countryside.

Role of Community Development

The responsibility for carrying out these programmes rests with State Governments acting through their Community Development Organisation of which both officials and non-officials form integral parts. This Organisation is entirely under State Governments. The task of this Organisation is twofold:

Firstly, it should create among the millions of families living in villages a desire for higher standards of living and the determination to work for them. The aim should be to lift the people out of themselves and enlist their active interest and support in the task of bettering their own conditions. "The agriculturists must be made to feel how vital is the part they have to play in the nation's economy and that there is, on the side of the Government, a realisation

of this and a determination by carefully planned measures to assist them in their efforts to achieve a higher level of living."

Secondly, the Organisation should ensure adequate and timely supply of technical advice, services and credit reaching every family through a village panchayat and a village co-operative. The panchayat and co-operative should arrange for the production of improved seeds and organic and green manures needed in the village and for the supply of fertilisers. They should ensure that these are used by every family and the credits are returned at the proper time. They should also ensure that every family saves not only for the finances needed for the agricultural operations in the village but also for investment in the small savings movement which is meant to support the Plan. There should be a phased programme for every village—and for every family—for all these purposes. What must be realised is that all programmes should have the support of the people and all the best non-official leadership available should be mobilised for the purpose.

In the discussions with States, financial and other allocations have been made on the basis outlined above and targets of achievements have been fixed. It is hoped that, in the remaining years of the Plan, the activities in States will gain momentum, and production and savings will reach the levels envisaged.

Industrial Production Satisfactory

So far I have spoken about increase in agricultural production. Industrial production is being maintained at a satisfactory level. It is also gratifying that small scale industries are showing good results and the organisation into co-operatives of handloom weavers is proving a signal success. The savings movement in urban areas, however, needs greater attention. There must be savings units in every office—public, municipal, bank or insurance—and in every industrial unit. Where urban co-operatives exist, they should become the agency for savings campaigns. Where they do not exist, new co-operatives should be formed for parts of towns to stimulate savings.

An Exciting Adventure

To sum up: The nation has to organise itself in a democratic manner for large scale efforts in production and saving. It is only in this way that we can implement the programme we have placed before ourselves of doubling the *per capita* income within 20 years. Here is an exciting adventure in which every one, whatever his or her position in life, can play a useful part.

***

ANOTHER RAW MATERIAL MADE IN INDIA

A new development in the plastics industry has recently been announced by Messrs. R. A. Cole Private Limited of Bombay, who manufacture a rigid, synthetic foam building and insulation material called THERMOCOLE, from a special grade of imported polystyrene.

The company has now nearly completed erection of a plant near Bombay for the manufacture of this special grade of polystyrene, by the block polymerization process. An imported styrene monomer will provide the basic material.

The new plant will go into production by the end of February with an estimated output of 30 tons per month.

Members of Chinese Co-operative cleaning their rice.

J. N. Tata

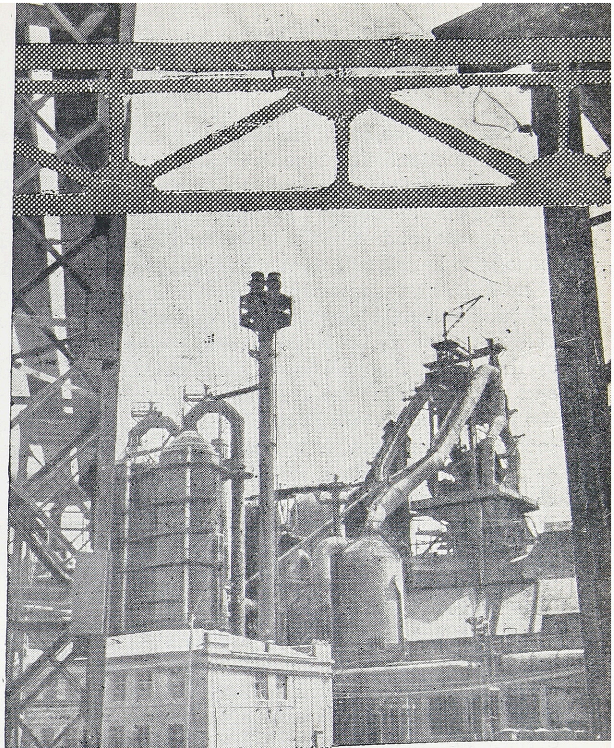
Steel is the measure of Nation's economic health and this article sketches the spectacular progress of Indian Steel Industry.

STEEL INDUSTRY

"Industrialise or perish!" is a familiar slogan. We are being reminded every day of the force of this statement. No modern country which aspires to become prosperous can afford to underestimate the role of industry in its economy. If industry plays so important a part in a country's welfare programmes, where and how are we to go about it? The answer is *steel*. We need steel for everything, for agriculture, for transport, for building, for dams, for factories. In short, no productive activity, be it on a large scale or small, can go on without steel. Our independence is therefore vitally linked up with our capacity to produce the steel we want, in quantity as well as quality.

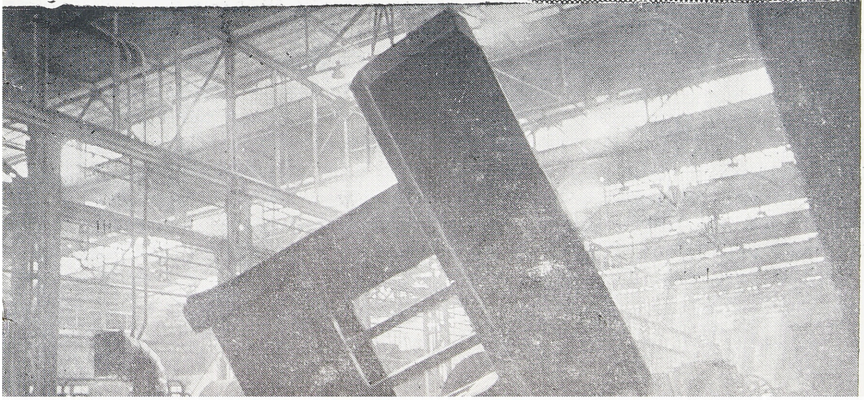
Perhaps not many know that Indians were among the earliest people in the world who produced steel. To every tourist who has visited the Qutab Minar in Delhi, the iron pillar of Chandragupta (5th Century A.D.) is a familiar sight. It bears testimony to the existence of a highly developed skill in the manufacture of steel in India in those times. If this achievement of our ancestors is a source of pride, it should equally be a source of inspiration in our efforts now to make India one of the leading manufacturers of finished steel. Our iron ore resources are very extensive. This country yields also coking coal, limestone, dolomite and manganese in equally plentiful quantities, not far from iron mines. All these raw materials are required to make steel, and we have them. What we need do is to exploit these resources, with determination and speed so that we may not have to depend long on foreign countries for importing this vital commodity.

The history of steel industry in modern India dates back only to 1907. It was in that year that the great industrialist, Jamshedji Nusserwanji Tata founded the Tata Iron and Steel Company at Jamshedpur. A few years later a similar undertaking, but much smaller in size, came up at Bhadravati in Mysore and a bigger one at Burnpur near Asansol. But between them, how much of steel do they produce? Very little. It is only about 1.4 million tons while what we require in the immediate present is 3 million a year.



Blast furnace of the Orsa-Khalilovo Works.

The Senior Foreman of the Works.



South Ural Engineeri Plant where machin for Bhilai are made.

The first Five Year Plan laid great stress on food production. The second Five Year Plan is more ambitious than the first and lays stress on building up the country's industrial potential so that by the end of 1960, India could at least manage to be self-sufficient in her requirements of steel. This gap of nearly 2 million tons, which is bound to grow bigger as we progress on the path of prosperity, we hope to bridge by setting up three new Steel Plants in the public sector and by expanding the existing steel works in the private sector. We have planned under the second Plan production of one million tons at each one of Rourkela, Bhilai, Durgapur Steel Plants: two million tons at Tata Iron and Steel Works: nine lakhes of tons at Indian Iron and Steel Works and one lakh of tons at Mysore Iron and Steel Works.

The Rourkela Steel Project

Building Steel Plants is no easy job. It connot be done without highly trained skill and machinery. We heed money and foreign exchange for both. The Rourkela Project was the earliest of the three to be taken up (1953). A Company—Hindustan Steel Limited—was promoted with an authorised capital of Rs. 100 crore. The German combine of Krupp and Demag are Technical Consultants for this project and they are also in charge of its construction. The Plant has been designed to produce one million tons of steel which is likely to be raised by an additional 75 per cent by the adoption of new process of steel-making known as the L. D. Process. In addition to producing the steel, this process will also yield 4.42 lakh tons of nitro-limestone fertilizers as a bye-product costing Rs. 170 crore. The Steel Plant will be in operation by the end of 1959.

Bhilai Steel Project

The Second Plan aims at producing 6 million tons of steel ingots in the country by 1960. The Government of U. S. S. R. came to our assistance. After negotiations which culminated in an agreement between the two Governments, a modern integrated Iron & Steel Plant with an initial capacity of 12 million tons of ingots was planned. Work is now briskly in progress at Bhilai (Madhya Pradesh). The entire Plant will be commissioned by December 31, 1959; the Plant and equipment will be supplied by the U. S. S. R. and India will pay its cost in 12 annual instalments at a concessional rate of interest. The money will be paid in rupees and so there will be no problem of foreign exchange. Indians will be associated at all stages of the planning, designing and execution of the Project and a sufficient number of Indian engineers and technicians will be trained in U. S. S. R. The cost of the Project as modified and accepted in March 1956 is estimated at Rs. 115 crore. Work has started in Bhilai and there is every reason to believe that it will progress according to schedule.

Durgapur Steel Project

The 3rd Project which again is designed to produce one million tons of ingot steel is expected to be completed by the end of this Plan. The Durgapur Project is an Indo-British undertaking. Messrs International Construction Company of United Kingdom will be in charge of the construction and they will be advised by Messrs. Indian Steel Works Construction Company of London (a consortium of leading British Steel and other allied interests). The latter, with whom the contract was signed in October 1956 are responsible for supply, construction and erection of the Plant in its entirety. The Steel Works at Durgapur (West Bengal) will cost about Rs. 138 crore (excluding the township) with cost of equipment and Plant alone coming to Rs. 85 crore.

India's Industrial prosperity is dependent on steel. The progress of steel industry is in turn dependent on our resources of iron ore and coal, besides every other form of fuel. While it is true that we are having great difficulties in pushing through the Second Plan in every detail, our determination to hold on to our original schedule for production of steel and fuel, is unswerving. Whatever else may happen, the Government of India will retain its Steel Projects in the Core of the Plan.

* * *

AIR INDIA'S BOEING 707s

The 25th year of Civil Aviation in India, besides being an epochal event in itself, has also ushered in the Jet Age. We are now on the thereshold of this new Era in communications. Air travel in early 1960 will be in 140-passenger Jet Transports with a maximum speed of 600 miles per hour.

The latest information on the new Boeing Inter-continental 707 Jet Aircraft, with range and pay-load capabilities greater than those offered by any other transport now flying, gives an indication of what is in store for the passengers of the Jet Age.

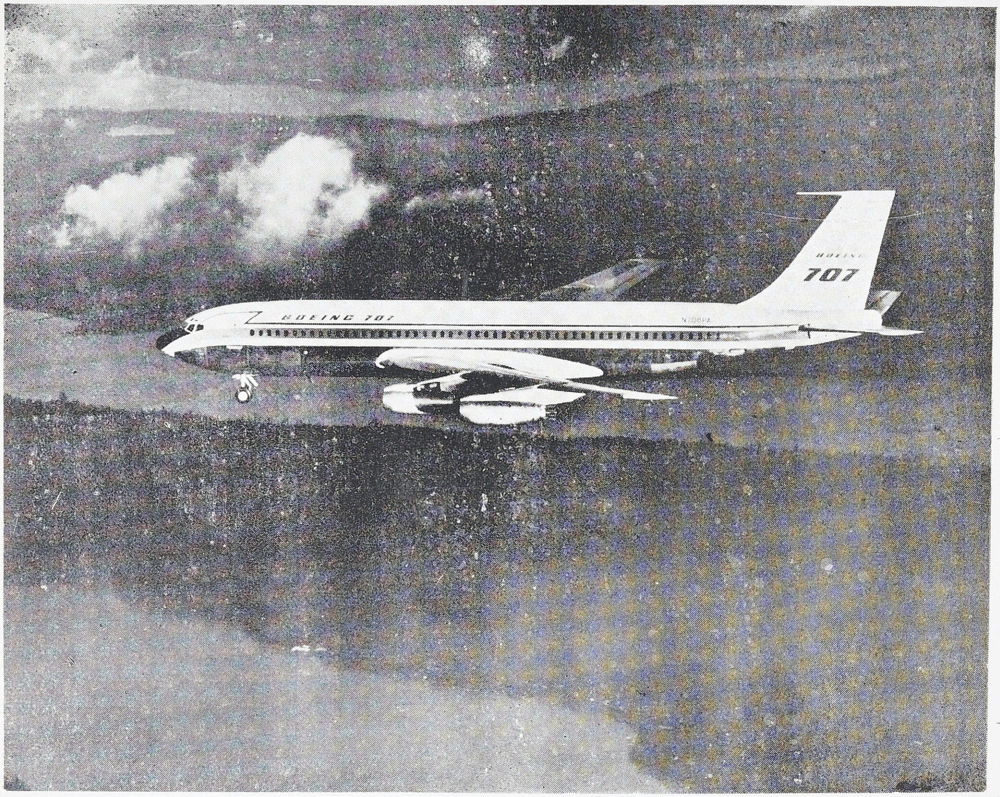
Air-India International has placed an order for three such giant airliners, the delivery of which is expected to commence in January 1960.

The new Jet transport will make possible non-stop Airline schedules between cities, continents apart, never before served on a non-stop basis, with full pay load. The Boeing Inter-Continental 707 will be capable of circling the earth in less than 40 hours flying time and with only five stops for fuel.

The enormity and size of the Jets can be visualised from the following facts: The 707 will weigh more than 280,000 pounds. This sleek Silver Giant will have an over-all length of 144 feet: 6 inches. The prototype has been flying since mid-1954 and has logged over 800 flying hours.

It has been used to test airplane components and systems used on the Commercial 707s and has provided invaluable flight experience.

The Boeing 707 will reduce flying times on all routes to less than half of the present time. To wit: London/Cairo in 4 hours and 10 minutes; Cairo/Bombay in 4 hours and 50



minutes ; Bombay/London in less than 10 hours and Bombay/Tokyo in 9 hours.

Out of a total of 118 seats, Air India's seating configuration will be 28 Slumberettes and 90 Tourist Seats. On an all-out tourist configuration, the 707 will accommodate as many as 140 passengers.

Representing a vast improvement over the present day Piston-engined air-planes, the 707 will climb, after take off, 30,000 feet in less than 15 minutes.

Air India's 707s will be equipped with Airborne Radar, which provides the Commander with a pictorial representation of weather conditions miles ahead. Forewarned, he recharts the course, thereby avoiding bad weather and assuring smooth and comfortable flying condition for the passengers of the Jet Age.

* * *

A BOOK YOU MUST BE PROUD TO POSSESS

THE DANCE OF DUST

By

KRISHNA SRINIVAS

★

" There is a great deal that is uncommonly beautiful in the exquisite phrasing and delicate symbolism employed throughout.

Mr. KRISHNA is a mystic and an aesthete-qualities that are his heritage. But the qualities of the west are here too and strong ! Americans will recall Whitman in the poet's call of cities and places—in the egoism of the second poem—and in the constant reaching towards democracy.

THE DANCE OF DUST, the first of the three is one of protest—a passionate protest of the fire and lust which has so for been man's use of the gift of life. The Second poem THE MUSIC OF THE SOUL is a group of exquisite tone poems and through these twenty seven pieces, the language sings. QUEST, the last of the three, tells in magnificent imagery that wickedness has ravished the world—burnt it into a charred mass which is its purification —and from the ashes of purification, mankind might have another chance.

If I were a symphonic composer, I would be unable to resist the impulse to create the music inherent in this cycle."

★

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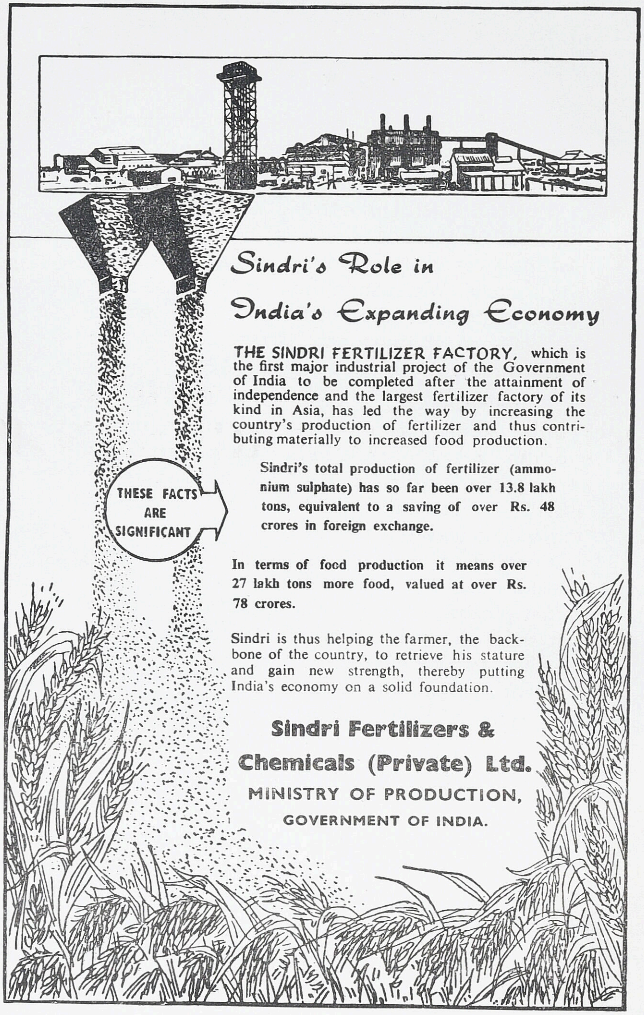

Sindri's Role in
India's Expanding Economy
THE SINDRI FERTILIZER FACTORY, which is the first major industrial project of the Government of India to be completed after the attainment of independence and the largest fertilizer factory of its kind in Asia, has led the way by increasing the country's production of fertilizer and thus contributing materially to increased food production.
THESE FACTS ARE SIGNIFICANT
Sindri's total production of fertilizer (ammonium sulphate) has so far been over 13.8 lakh tons, equivalent to a saving of over Rs. 48 crores in foreign exchange.
In terms of food production it means over 27 lakh tons more food, valued at over Rs. 78 crores.
Sindri is thus helping the farmer, the backbone of the country, to retrieve his stature and gain new strength, thereby putting India's economy on a solid foundation.
Sindri Fertilizers & Chemicals (Private) Ltd.
MINISTRY OF PRODUCTION,
GOVERNMENT OF INDIA.

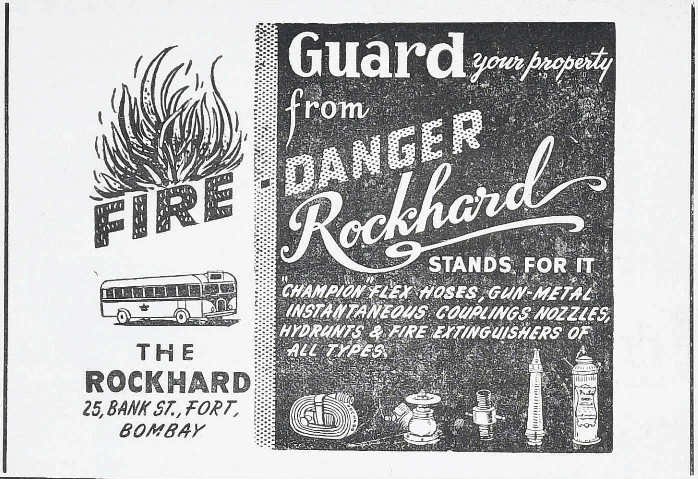
INDUSTRIAL PROGRESS IN 1957

The giant Hirakud Dam in Orissa completed the first and the major stage of its construction. Work began in right earnest on the three new steel plants at Bhilai, Durgapur and Rourkela; and, at Neyveli in the South, they dug out the first substantial supplies of lignite. The Tribhuvan Raj Path, road connecting India with Nepal built by Indian army engineers, was completed and presented to the Nepalese Government.

The year saw a further flowering of the country's cultural life. The Youth Festival, an annual function organised by the Union Education Ministry, encouraged new talents in dance, drama and music. At the Sahitya Sammelan and the National Symposium of Poets, sponsored by All India Radio, writers of many languages and regions got together to discuss problems of common interest.

In the year of Suptniks and guided missiles, India's voice kept steadily urging the cessation of big power armament race and utilisation of the power released by progress in science for peaceful purposes. India's links with the rest of the world were strengthened as a result of the goodwill visits paid by the Prime Minister, Shri Jawaharlal Nehru, during the year, to Ceylon, Japan, Sweden and Denmark. The Vice-President. Dr. Radhakrishnan, undertook a highly successful goodwill tour of South-East Asian countries in October.

During the year, distinguished visitors came to India from the four corners of the world. Early in the year came Prime Minister Chou En-lai of China, accompanied by his Vice-Primier. Distinguished Ministers came from Iran, Denmark, Sweden, Yugoslavia and Malaya.



India was also the venue of a number of international conferences. New Delhi itself was the scene of three major conferences; the 14th International Tuberculosis Conference in January, the Asian Legal Consultative Committee meeting in April and the Commonwealth Parliamentary Conference in December.

Many New Trails Blazed

The momentum of industrial development was not only maintained during 1957; it also acquired greater substance and speed. The general index of industrial production which stood at 133 in 1956 rose to 148.8 in the first nine months of the year.

Considering that the year was one of stress and strain, in view of the need to conserve the foreign exchange resources, it is remarkable that there was no diminution in the output of even those industries which depend to a great extent on imported raw materials and components. Production in the major industries witnessed a further rise, while the "younger" industries, like engineering and machinery units, recorded appreciable increases over the previous year. The output of consumer goods also was at a higher level.

An impressive range of new articles were manufactured for the first time in 1957. To mention a few of these: machine tools like milling machines, hydraulic surface grinders and capstan lathes (1" capacity), sewing machine needles, hypodermic needles, diesel road-rollers, automobile ancillaries like clutch and brake assemblies, synthetic detergents, raw materials for plastics, synthetic stones, etc.

Foreign Exchange

To overcome the difficult foreign exchange situation a system of imports of capital goods on deferred payments was introduced. This has met with a measure of success as can be seen from the fact that 85 industrial schemes involving import of plant and machinery on deferred payments were approved during the first 11 months of 1957. The value of the deferred payments arranged was Rs. 42.58 crores. Industries like cement, sugar, textiles, chemicals, refractories and engineering benefited by these arrangements. At the same time Indian industrialists were able to secure foreign capital participation of the order of nearly Rs. 8 crores.

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This was in addition to the deferred payments and other credit arrangements made for projects in the public sector like the heavy machinery schemes, fertilizers, coal mining, etc. An agreement for utilising the Soviet credit offer of 500 million roubles for five major projects, largely for heavy machinery, was concluded during the year. Three major contracts for the Nangal Fertilizer and Heavy Water Project were also placed during the year—all on deferred payments.

Negotiations for deferred payments for other projects were nearly completed during the year and in the case of the Foundry Forge Project a definite understanding was reached. Government agencies like the State Trading Corporation helped manufacturers to import their machinery requirements on deferred payment basis by entering into arrangements with exporters' organizations in foreign countries.

The new Steel Plants at Rourkela and Bhilai began to take shape during the year. Progress was also made on the expansion of the two big plants in the private sector. The year 1958 may well see the coming into fruition of at least the early stages of this big steel expansion. The Sindri factory reached an advanced stage.

The completion of the preliminary stages of the heavy machinery project, which will enable India to produce major items of steel plants and heavy chemical plants, was yet another important feature of the year 1957.

The levels of employment offered by organised industries were higher production trends. For instance, the cotton textiles industry employed 14,000 people more in 1957 than in the previous year, the bicycle industry employed nearly 2,000 people more, the automobile industry offered employment to nearly 1,350 people more, the electrical engineering industries over 3,300, the chemical industries nearly 1,000, cement nearly 500, rayon nearly 2,000, and mechanical and general engineering industries nearly 4,400.

Higher Production

Coming to production figures (based on actual production for the first nine or ten months and estimates for the remaining period) the output of cement was 5.5 million tons, an increase of about 5.7 lakh tons over 1956.

The total coal mined during the year was 42.34 million tons against 39.42 million tons in the previous year. Steel output rose to 1,342,000 tons from 1,316,000 tons in 1956. The output of cotton textiles by the mill sector is estimated at 5,327 million yards as against 5,307 million yards in the previous year. The increase although slight is significant in view of the somewhat static conditions obtaining in the cloth market during the year. The production of yarn was up by nearly 103 million pounds rising to 1,774 million pounds.

Among other consumer industries the increases were much higher. Nearly eight lakh complete bicycles were manufactured during the year, an increase of over 1.36 lakhs. The output of sewing machines was up by nearly 50,000 the total production being estimated at 1.8 lakhs. Razor blade production increased from 265 million to 364 million during the year. The production of automobiles increased from 32,138 to nearly 33,400.

About 34,400 more radio sets were manufactured during the year raising total output to 1.85 lakh sets. The output of electric fans was up by nearly 50 per cent, the total production being 5.13 lakh fans. Electric lamps rose to 33 million from 29.85 million and fluorescent tubes to nearly one million from 8.81 lakhs. Among other consumer goods, soap (1.15 lakh tons), cigarettes (27,000 million), paper (2.1 lakh tons) and pencils (7.6 lakh gross) showed increased outputs.

Impressive rises were recorded in the output of machine tools and machinery items. The production of complete machine tools was more than doubled, the total value of the output being Rs. 2.2 crores during 1957. The output of jute mill machinery rose from nearly Rs. 30 lakhs to over Rs. 1.04 crores.

Among chemicals, the production of soda ash, caustic soda, sulphuric acid, super phosphates and chlorine, was a considerably higher. There was a uniform increase in the output of ceramics, glass and glassware refractories. The production of rayon yarn was significantly higher.

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